

REMARKS

The Office Action of September 19, 2006 has been received and its contents carefully considered. Reconsideration is respectfully requested in view of the amendment and the following comments.

Claims 1-8, 10-13, and 16-24 have been cancelled without prejudice. Claims 9, 14 and 15 were cancelled in the previous Amendment of August 30, 2006. New claims 25-46 have been submitted. No new subject matter has been introduced. Claims 25-46 are currently pending in the instant application.

I. Personal Interview with Examiner of January 17, 2006

Applicant's representative, Laleh Jalali, would like to thank Examiner Golub for the gracious personal interview accorded on January 17, 2006, during which the substance of the Instant claim Amendments, and their differences with respect to the prior art, were discussed in details.

In particular, regarding new independent claim 25, Applicant mentioned ample support for the same in the original disclosure, such as, for example, throughout the specification, and in particular at page 6, paragraph 20, and in now cancelled original claims 1 and 13.

The details of the many distinctions between the newly presented claims and the prior art of record, and, in addition, Rosenberg et al. (U.S. 6,703,561) submitted in an Information Disclosure Statement filed concurrently herewith (hereinafter "concurrent IDS") will be discussed in the Sections below.

Applicant would like to thank the Examiner for having explained, during the Interview, some of her thinking with respect to Applicant's claim suggestions. Applicant has found Examiner's thoroughness valuable in submitting the instant new claims. In doing so, Applicant has attempted to take into consideration all of the Examiner's remaining concerns mentioned during the Interview.

In particular, the Examiner pointed out that one feature that would distinguish embodiments with respect to the prior art of record would be the fact that, when placed on a board, the substrate would extend parallel to the board, and not perpendicular thereto. Applicant has incorporated this feature, supported in the specification for example in Fig. 2 (where, clearly the module is shown as being surface mountable such that the substrate bottom surface determines footprint), and at page 5, paragraph 18 in relation to Fig. 3a, where a "footprint" of the module is indicated as being related to the bottom TEC surface, which in turn is mounted flush in Fig 2 against the upper surface of the substrate. It is widely known by persons skilled in the art that a "footprint" in the context of electronics applies to the pattern and space taken up by a component on a host board.

In addition, the Examiner suggested adding to the new independent claim the feature that the TEC is disposed between the laser light source and the substrate. New independent claim 25 has been written to include the above feature.

During the Interview, the Examiner also suggested other features that, in the Examiner's opinion, could be added to independent claim 25. Those features, added in the amendment above in the form of new dependent claims, are listed below,

along with Applicant's comments and approach to addressing the Examiner's concerns:

- (1) With respect to features of the TEC added to now cancelled independent claim 1 in the Response of July 11, 2006, which included details of a possible structure for the TEC, Applicant has included such details in new dependent claim 29. Details regarding a possible structure for the TEC according to embodiments were originally added to now cancelled independent claim 1 in order to overcome Stewart et al. (US 2003/0043868). However, it is submitted that Stewart et al. are inapplicable to new independent claim 25 even without the addition of further TEC features.
- (2) With respect to specifying that the TEC is disposed on the lower portion of the upper surface of the substrate, Applicant submits that adding such limitations to the independent claim 25 would not be necessary to overcome any of the prior art of record. As such, those features have been introduced in new dependent claim 35.
- (3) With respect to the feature of a laser light control device electrically connected to the laser light source, that feature has been introduced by way of new dependent claims 27 and 28. Those claims find their support in the original specification, for example at page 6, paragraph 20, which, in describing a function of the higher portion of the substrate 112 with respect to Fig. 2, disclose that "this feature allow e.g. a driver or an amplifier 104 to be optionally placed

in very close proximity to the laser light source 102." New dependent claim 27 has therefore been written, as mentioned during the Interview, to introduce the "e.g. a driver or an amplifier 104" as a "laser light control device" which, as set forth in dependent claim 28, may include a "driver" or an "amplifier." It is noted that the feature of the "laser light control device" has been set forth in dependent claims rather than in the independent claim to the extent that the feature is not deemed by Applicant as being necessary to distinguish with respect to the prior art of record.

Further to the above, it is noted that the feature of an enclosed environment (discussed during the Interview) within which the components of the optoelectronic module may be disposed (discussed during the Interview as possibly being part of the independent claim) has been introduced in a dependent claim 26 as Applicant does not deem that feature to be necessary to distinguish new independent claim 25 from the prior art of record.

It is noted with respect to the language of new independent claim 25 that, although the claim contains some of the features suggested by the Examiner during the Interview, that fact does not necessarily indicate a concession by Applicant that such features are needed in the independent claim to distinguish with respect to the prior art.

Other distinguishing features were discussed, which will be mentioned throughout the arguments presented below.

II. Rejection under 35 USC 103(a)

Claims 1-8, 10-12, 23 and 24 have been rejected under 35 USC 103 (a) under various combinations of references including Watts et al. (6,729,143), Acklin et al. (6,778,576) and Stewart et al. (2003/0043868). Reconsideration is respectfully requested. (It is noted parenthetically that the statement of the rejection in the outstanding Office Action contained a reference to claim "13", although that claim was withdrawn in the previous response. For that reason, Applicant will deem the reference to claim 13 as being merely a typo).

The rejection under 35 USC 103(a) of claims 1-8, 10-12, 23 and 24 has been rendered moot by virtue of their cancellation. Some of the distinguishing features the new claims with respect to the prior art of record, a number of which were discussed during the Interview appear below.

A. Watts et al.

Embodiments as set forth in new independent claim 25 are neither disclosed nor suggested in Watts et al. Watts et al. fail to suggest among other things an optoelectronic module including: a substrate defining a stepped upper surface having a lower portion and an upper portion, the substrate being configured such that a lower surface thereof determines a footprint of the module; a thermo-electric cooler disposed on the substrate; and a laser light source disposed on the thermo-electric cooler such that the thermo-electric cooler is disposed between the substrate and the laser light source, wherein the thermo-electric cooler is thermally coupled to the laser light source to cool the laser light source; where electrical connection extends from

the upper portion of the upper surface of the substrate to the laser light source, as set forth in new independent claim 25.

The Examiner had applied the embodiment of Fig. 9 of Watts et al. to now cancelled independent claim 1. Nowhere does the embodiment of Fig. 9, or any other ones of the embodiments disclosed in Watts et al. either disclose or even remotely suggest that an electrical connection could extend from the step of the package base 11 supporting lens 16 thereon. In Watts et al., the step in base 11 is merely provided to support lens 16 in order to accommodate an extended optical train. In addition, in Watts et al. the laser assembly including carrier 90 and laser 12 are fully functioning without the need for a further electrical connection. Assuming arguendo that it would be possible to modify Watts et al. to include an electrical connection from the step of base 11 to the laser 12, such an electrical connection would undeniably result in a lead the length is which is long as compared with an overall length of the base 11, in this way disadvantageously raising the possibility of heating of the lead or of signal problems within the lead. The only suggestion for a modification of Watts et al. to include an electrical connection from the step of base 11 to the laser carrier 90 or laser 12 would have to come from Applicant's own specification. At least for the above reasons, new independent claim 25 is patentable over Watts et al.

In addition, nowhere do Watts et al. disclose or even suggest a structure defining an enclosed environment as set forth in dependent claim 26, or a laser light control device as set forth in dependent claim 27, such as a driver or amplifier as set forth in dependent claim 28. Watts et al. suggest, as seen for example in Fig. 9 by

way of the laser carrier 90, that any integrated circuits controlling the laser light are carried by the TEC's.

It is thus submitted that new independent claim 25 is patentable over Watts et al. taken either alone or in combination with any other ones of the references of record. It is further submitted that new dependent claims 26-46 are likewise patentable over Watts et al. taken either alone or in combination any other ones of the references of record at least by virtue of being dependent from new independent claim 25, and further for the particular additional features that they recite.

B. Acklin et al. and Stewart et al.

Acklin et al. and Stewart et al. were used as secondary and tertiary references in combination with Watts et al. in the Examiner's outstanding rejections of the now cancelled claims under 35 USC 103(a).

An analysis of both Acklin et al. and Stewart et al. indicates that embodiments as set forth in new independent claim 25 are neither disclosed nor suggested in either of those references.

Acklin et al. among others fail to suggest (as underlined below) an optoelectronic module including: a substrate defining a stepped upper surface having a lower portion and an upper portion, the substrate being configured such that a lower surface thereof determines a footprint of the module; a thermo-electric cooler disposed on the substrate; and a laser light source disposed on the thermo-electric cooler such that the thermo-electric cooler is disposed between the substrate and the laser light source, wherein the thermo electric cooler is thermally coupled to the laser

light source to cool the laser light source; where an electrical connection extends from the upper portion of the upper surface of the substrate to the laser light source, as set forth in new independent claim 25.

Stewart et al. among others fail to suggest (as underlined below) an optoelectronic module including: a substrate defining a stepped upper surface having a lower portion and an upper portion, the substrate being configured such that a lower surface thereof determines a footprint of the module; a thermo-electric cooler disposed on the substrate; and a laser light source disposed on the thermo-electric cooler such that the thermo-electric cooler is disposed between the substrate and the laser light source, wherein the thermo-electric cooler is thermally coupled to the laser light source to cool the laser light source; where an electrical connection extends from the upper portion of the upper surface of the substrate to the laser light source, as set forth in new independent claim 25.

It is thus submitted that new independent claim 25 is patentable over either Acklin et al. or Stewart et al., taken either alone or in combination with any other ones of the references of record. It is further submitted that new dependent claims 26-46 are likewise patentable over Acklin et al. and Stewart et al., taken either alone or in combination any other ones of the references of record, at least by virtue of being dependent from new independent claim 25, and further for the particular additional features that they recite.

C. Rosenberg et al.

The Rosenberg et al. reference was discussed during the Interview as being relevant to the subject matter disclosed in the original specification, with particular emphasis on the embodiment disclosed in Rosenberg et al.'s Figs. 4A-4C.

An analysis of Rosenberg et al. reveals that that reference among others fails to suggest (as underlined below) an optoelectronic module including: a substrate defining a stepped upper surface having a lower portion and an upper portion, the substrate being configured such that a lower surface thereof determines a footprint of the module; a thermo-electric cooler disposed on the substrate; and a laser light source disposed on the thermo-electric cooler such that the thermo-electric cooler is disposed between the substrate and the laser light source, wherein the thermo-electric cooler is thermally coupled to the laser light source to cool the laser light source; where an electrical connection extends from the upper portion of the upper surface of the substrate to the laser light source, as set forth in now independent claim 25.

As suggested in Figs. 4A and 4B in particular, and as pointed out by the Examiner during the Interview, embodiments distinguish over Rosenberg et al. by virtue of a lower surface of the substrate of embodiments as determining a footprint of the module. In Rosenberg et al., on the other hand, a header assembly is disclosed with a structure vastly different from the structure of the module of embodiments, where the substrate supporting the laser light source and the thermo-electric module are adapted to be disposed perpendicularly to the board adapted to receive the header assembly.

In addition, nowhere do Rosenberg et al. disclose or even suggest a laser light control device disposed on an upper portion of the stepped surface of the substrate as set forth in dependent claim 27, such as a driver or amplifier as set forth in dependent claim 28.

During the Interview, the Examiner suggested that the conductive pathways of feedthru 802 of Rosenberg et al. could be interpreted as constituting a "laser driver," and, as such, that Rosenberg et al. disclosed the features of now claims 27 and 28. However, it is submitted that, as supported by the original disclosure, a "driver" for a laser device includes more than mere electrical conductive pathways. First, as set forth in the specification at page 6, paragraph 20, the upper portion of the stepped surface of the substrate allows the "e.g. a driver or an amplifier" to be placed in close proximity of the laser light source. If, as interpreted by the Examiner, a "driver" as intended in the specification could encompass merely conductive pathways, the provision of the upper portion of the substrate would become superfluous, as such a step would not be needed to bring a conductive pathway in close proximity to the laser light source. Second, it is widely known that a laser driver encompasses an IC. See for example:

http://www.maxim-ic.com/glossary/index.cfm/Ac/V/ID/192/Tm/Laser_Driver
which defines a laser driver as "[a]n IC that supplies modulated current to a laser diode in response to an input serial-data stream."

It is thus submitted that new independent claim 25 is patentable over Rosenberg et al. taken either alone or in combination with any other ones of the references of record. It is further submitted that new dependent claims 26-46 are

likewise patentable over Rosenberg et al. taken either alone or in combination any other ones of the references of record at least by virtue of being dependent from new independent claim 25, and further for the particular additional features that they recite.